Amendments to the Specification:

Please replace the paragraph beginning on line 20, page 2 with the following amended paragraph:

It is an object of the invention to provide an improved method for optimising at least one property of a satellite system, more specific it is a goal of the invention to provide a method which is more flexible. ~~The invention therefore provides a method according to claim 1.~~

Please replace the paragraph beginning on line 25, page 2 with the following amended paragraph:

~~The said~~ This property of the satellite system is changed when the data error check satisfies a predetermined criterion. The data error is a measure for the quality of the signals outputted by the satellite receiver. Hence, the property can be optimised by increasing the quality of the signals ~~via~~ by adjusting ~~said~~ this property. The method is flexible because the data error at least partially depends on properties other than the phase shift and attenuation, and hence can be used to optimise such properties. Furthermore, determination of the data error can be performed in a simple manner.

Please replace the paragraph beginning on line 1, page 3 with the following amended paragraph:

The invention further provides an optimisation device ~~according to claim 19. Such an optimisation device~~ which can

be implemented in a satellite system and used to optimise one or more properties of the satellite system.

Please replace the paragraph beginning on line 4, page 3 with the following amended paragraph:

The invention also provides an satellite receiver, ~~according to claim 20. Furthermore, the invention provides~~ a satellite system ~~as claimed in claim 21. The invention further provides~~ and a computer program product ~~as claimed in claim 22~~.

Please replace the paragraph beginning on line 24, page 6 through line 6, page 7 with the following amended paragraph:

In the receive mode, the antenna elements 41-44 provide received signals, e.g. the satellite signal 3, received from an external source, e.g. the satellite 2, through the respective phase shifters 521-524 and attenuators 511-514 in the signal shaper circuit 5 to the signal processor circuit 6. In the receive mode, the signal processor circuit 6 may use a combiner for combining the received signals into a single signal. The control circuit 7 is operable with the time or phase shifter circuits 521-524 and the amplifier circuits 511-514 to change the phase and the amplitude of the signals received by antenna elements 41-44. The control circuit 7 sets the time or phase shifts and the amplification to form a reception pattern in a specified direction. The control circuit 7 can also change the time or phase shifts and/or the amplification factors to steer the reception pattern, form a different reception pattern, or

the like. Typically, in the receive mode each of amplifier circuits 511-514~~515~~ is set approximately at a suitable common level such that each of antenna elements 41-44 feed the signal processor circuit 6 in the same manner. However, these levels may be varied, for example for beam shaping or beam direction purposes.

Please replace the paragraph beginning on line 12, page 9 with the following amended paragraph:

The data error ~~determiner~~ determining device may for example comprise a Viterbi error decoder or a Reed-Solomon decoder which determines the data errors via Viterbi or Reed-Solomon forward error correction. For the sake of brevity the Viterbi algorithm and Reed-Solomon error correction coding are not described in further detail, as these are generally known in the art of error coding for example from K. Sayood, "*Introduction to data compression*", 2nd edition, Morgan Kaufman 2000, p. 301-305.

Please replace the paragraph beginning on line 1, page 10 with the following amended paragraph:

For example, if the satellite signal represents binary data, the data error ~~determiner~~ determining device may be a parity check device which performs a parity check. In general, in a parity check the values of bits in a string of data are added up. If the added values are an even number, a binary one is outputted and when the added values are an uneven number a binary zero is outputted. The binary one or binary zero is compared with a reference bit sent together with the string of data, which reference bit represents

whether the added values should be even or uneven and hence errors in the string of data can be detected.

Please replace the paragraph beginning on line 8, page 11 with the following amended paragraph:

In general, in an antenna or an antenna array characteristics of the antenna or the antenna elements are initially unknown. For example, ~~because~~ the characteristics of the antennas are subject to unavoidable errors and variations due to for example manufacturing tolerances and to various changes occurring as a function of time and temperature. For the sake of completeness, it should be noted that in the art of antenna arrays, a large number of estimation techniques are known to calibrate the characteristics of the antenna elements and/or the amplifier circuits and/or the time or phase shifter circuits. However, the known techniques are usually complicated and in general require mathematical optimisation of large matrices and hence a large amount of computational power.

Please replace the paragraph beginning on line 18, page 12 with the following amended paragraph:

In the optimisation circuit 8, the data error determining device 82 determines data errors in data represented by the antenna signal, for example by an error detection mechanism as explained above in more detail or otherwise. The calibration signal transmitted by the transmitter may represent some predetermined calibration data. The data error determining device 82 may comprise a calibration memory in which the predetermined calibration

data are stored. Further the data error determining device may determine from the antenna signal received at the error input 81 received calibration data and compare the received calibration data from the signal with the known calibration data and thus determine data errors in the calibration signal. After determining the data errors in the antenna signal, the data error determining device 82 will provide an error signal representing a value of a characteristic of the data errors in the calibration signal to the calibration adjuster device 83. The value may for example be the BER (Bit Error Rate) or otherwise.

Please replace the paragraph beginning on line 3, page 16 with the following amended paragraph:

The effect of a polarisation mismatch or off-set between the satellite receiver 1′ and the transmitter or the satellite signal is graphically presented in FIG. 5. In FIG. 5, the axis X and Y represent the direction of the polarisation of the X-antenna 401 and the Y-antenna 402 respectively. The arrows V and H represent the direction of the polarisations of the satellite signals when transmitted by the satellite. The polarisation mismatch angle is represented by the symbol α. The antenna elements generate an signal equal to the projection of V and H on the axis X ~~resp.~~ and Y, respectively. Thus, the X-antenna 401 generates a signal which comprises a combination of the differently polarised signals. The Y-antenna 402 generates a signal which is a combination of the differently polarised satellite signals as well.

Please replace the paragraph beginning on line 21, page 16 with the following amended paragraph:

The signal restore device 601 can perform an operation via which the satellite signals with different polarisations are extracted from the antenna signals. As is illustrated in FIG. 5, the antenna signals with polarisations X and Y are a (vector)sum of the original satellite signals with polarisations V ~~resp.~~and H, respectively.

Please replace the paragraph beginning on line 25, page 16 with the following amended paragraph:

The effect of the polarisation offset is graphically presented in figure 1. The axis X and Y represent the received signal of polarisations **V** and **H**. The antenna elements generate a signal equal to X and Y (see figure 5~~1~~). These signals are a (vector) sum of the original satellite signals **V** and **H**. The signal on antenna element X and antenna element Y can be written mathematically as:

$$X = \underline{H}\cos(\alpha) - \underline{V}\sin(\alpha) \quad (1)$$

$$Y = \underline{H}\sin(\alpha) + \underline{V}\cos(\alpha) \quad (2)$$

Please replace the paragraph beginning on line 1, page 17 with the following amended paragraph:

Therefore, to recover the original satellite signals **H** and **V**, the signals from antenna terminals X and Y are multiplied with ~~a sinus and a cosinus term~~sine and cosine,

respectively. Thus, the signal restore device 601 is arranged to perform the mathematical operation:

$$\underline{H} = Y\sin(\alpha) + X\cos(\alpha) \qquad (3)$$

$$\underline{V} = Y\cos(\alpha) - X\sin(\alpha) \qquad (4)$$

Please replace the paragraph beginning on line 25, page 17 with the following amended paragraph:

In this equation 5, 6, Re{} represents the ~~complex~~ real part of the complex quantity between the brackets, U_{RCP} represents the antenna signal of the RCP antenna, U_{LCP} represents the antenna signal of the LCP antenna, h,v represents the amplitude of the linear polarised satellite signals, ω represents the frequency of the signals, and **v** and **h** the polarised satellite signals.

Please replace the paragraph beginning on line 28, page 19 through line 14, page 20 with the following amended paragraph:

Fig. 6 shows an example of an implementation of the polarisation control. The control comprises two inputs 841, ~~at~~ each ~~of~~ for an antenna ~~signals~~ signal, with one polarisation can be inputted. The inputs 841 are each connected to a variable phase control 842,843. The phase of the variable phase controls 842,843 is controlled separately by an output signal of an error detector 82', The outputs of the variable phase controls 842,843 are each connected to a separate input of an first combiner 844. The first combiner 844 has a combiner output 847~~848~~ at which the original satellite signal **h** of one polarisation is presented. This

output is connected to the input of the error detector 82'. The output of the one of the variable phase controls 842~~843~~ is further connected to a phase shifter 845 which provides an 180-degrees phase shifted signal to an input of a second combiner 846. Another input of the second combiner 846 is connected to the output of the other variable phase control 843~~844~~. The second combiner provides the original satellite signal **v** of the other polarisation at its combiner output 848. Thus, in this example only the original satellite signal of one polarisation is used to optimise the polarisation.

Please replace the paragraph beginning on line 5, page 21 with the following amended paragraph:

The optimisation circuit 8 may comprise an attenuator device between the optimisation input 81 and the data error determining device 82.The attenuator device changes the amplitude of the received signal before determining the data error from the data. Thereby, the signal received at the error input 821 can be regarded as generated by a virtual antenna array with a virtual antenna beam, which differs from the real antenna beam, i.e. which~~has.~~ has an increased number of errors compared to the real antenna beam. Thereby, the data error determining device 82 and the beam adjuster device 85 operate on the virtual antenna array thus preventing that the quality of the received real antenna signal ~~comes~~ becomes ~~to~~ too low. Furthermore, in case the real antenna beam is adjusted, the error rate in the signals may become very low and may be not detectable anymore without the real antenna beam being fully optimised. The virtual antenna beam has an increased error rate compared to

the real antenna beam and may thus have an error rate above the minimum level that is detectable. Because of the virtual antenna beam with an ~~increase~~ increased number of errors, the real ~~antanne~~ antenna beam can thus be optimised even when the error rate in the signals from the real antenna is below level of detection.

Please replace the paragraph beginning on line 26, page 21 with the following amended paragraph:

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design alternatives. Examples of the invention have been described above applied to the calibration, the polarisation and the antenna beam of an antenna array. However, the invention may likewise be applied to different properties of a satellite system, such as the position of the transmitter with respect to the satellite receiver (e.g. of an antenna ~~a~~ with respect to satellite) or otherwise.

Please replace the paragraph beginning on line 1, page 22 with the following amended paragraph:

Furthermore, the invention is not limited to application in a satellite receiver with an antenna array, but may likewise be applied to satellite receivers with other antennas. Furthermore, the invention can likewise be applied as a data carrier comprising data representing a computer program product, comprising program code for performing steps of a method according to the invention when run on a programmable device. Such a data carrier can for

example be a read only memory compact disk (CD-ROM) or a signal transfer medium, such as a telephone cable or a wireless connection. The programmable device may be of any suitable type. For example, it may be a computer communicatively connected to an antenna array. However, the computer may likewise ~~be~~ not be connected to a sensor array, but receive data representing signals from the array, e.g. via a floppy disk or a compact disk.